REDUCTION TECHNICAL SUB-COMMITTEE

Meeting Minutes - June 29, 1982

Present: D. W. Everett
E. L. Cambridge
T. F. Payne
E. E. Krouse
J. L. Yeager
F. N. Mudge
J. G. Kaufman

I. Review and Update of 1982 Program

A. Alternative Cokes

R & D is presently formulating a specific program. The short-term aspects will focus on optimizing usage of presently available cokes at each plant. Specific proposals have been prepared.

The intermediate and long-term aspects will investigate methods for purification of petroleum coke to counteract decreasing quality and/or production of anode-grade coke from alternative materials, most probably bituminous coals.

Following implementation of a high-grading procedure and other changes at Cherry Point, Arco coke can now meet Columbia Falls coarse aggregate requirements. As a result, a large-scale plant test will be undertaken as a first step of converting to Arco coke as the major supply. Problems with increased shot-coke content in Collier's material have not yet been totally resolved.

B. Petroleum Pitch

The R & D evaluation of Ashland A-240 will be available by October 15, at which time a decision to either drop the project, initiate an R & D program to upgrade or plant test will be made. There is currently no technical information to support an immediate plant test.

C. High Conductivity Blocks

220 pots currently have high-conductivity bottom blocks installed. Cathode voltage drop is reduced by 40 mv and an increase of 1.2 years in lining life is projected. Savoie HC-10 blocks have been identified as a possible alternative source for testing. Mitsubishi blocks will also be investigated.

D. Anode Skirts/Flanges

Anode casings are being rebuilt with 304 stainless steel flanges. Additional life should economically justify the incremental material cost.

Spray metallizing has been proposed to increase skirt life. Columbia Falls is awaiting bids from 2 firms for a test lot.

E. Cathode Life

A cost-effective cradle and deck plate design has been developed to address all six major problems associated with Columbia Falls cathode shell. A proposal to test this configuration has been made to local management.

F. Increase Pin Life

Nine pin tips have been forwarded to Tucson for aluminizing. These will be returned to Columbia Falls for testing.

G. Modified Electrolytes

Equipment is being set up in Tucson to conduct melt experiments. Any alumina modifications that might be required to enhance solubility in a low-temperature melt can not adversely affect dry scrubber operations.

H. Cell Magnetics

See "TIP" program status - attachment 1.

I. Lithium Fluoride

The Sebree test has been indefinitely suspended. The techno-economic analysis indicates that it is probably a marginal project.

The test group at Columbia Falls is now at 1.5 percent LiF and in the build-up phase. No problems have been encountered to date.

R & D have developed a techno-economic model for lithium usage and issued reports outlining its application to each plant

J. Large Area Anode

Sebree have received approval for definitional engineering and will be awarding a contract shortly.

R & D have issued a report of the preliminary look at the feasibility of a 24-day anode cycle. Design of an expanded plant test is planned for August.

K. Sensor Development

A proposal to develop a continuous bath temperature sensor has been put together by Paul Russell. Comments will be solicited from Columbia Falls and Sebree.

L. Auto GAD/Paste Temperature/Laser Carbon Setting

These projects will be incorporated into general anode improvement program by Sebree.

M. AD-108 Composite Anode

Recently this project has focused on development of the powdered anode concept. Significant difficulties were experienced with current conduction to the working-anode face. Longer term electrolysis runs with prebake anodes are being carried out to establish a cell-material balance for scale-up design and an updated economic evaluation. A simulator has been constructed to investigate the Soderberg anode configuration. Work is continuing to determine, by year end, the most promising anode configuration for further development.

N. Improved Purity

The electrostatic separation of basement material investigated by Tucson is not economically viable. Some iron can be removed magnetically from scrubber ore. The proposed new cathode design could prevent a lot of material from falling into the basements.

O. Potlining Reclamation

The report of the joint feasibility study with Alcan will be available mid-July. It appears possible that a recovery process can be developed which would have a positive ROI.

II. Update of Columbia Falls TIP Program

See attachment 1.

III. Sebree Improvement Program

A program will be formulated by August for anode preparation similar to the present program for potrooms. Projects on the present committee list will be incorporated.

IV. Planning Cycle for 1983 Budget

Project proposal sheets will be forwarded to all concerned early in July. The following target dates have been established.

August 20 - Proposals due in J. G. Kaufman's office

August 25-September 8 - Sub-committee recommendations

September 17 - R & D Policy Committee meeting

The next meeting of the sub-committee to consider submitted project proposals and recommend a specific program was tentatively scheduled for August 31, 1982, at 9:00 a.m. in Louisville.

V. Joint Programs - R & D - Operations

Interactions between R & D and operations are going fairly well. No major problems are apparent. It was generally agreed that the Development and Technical Services function in the R & D organization was necessary and tended to smooth out potential communication difficulties.

VI. Other

General support was expressed for a technical interchange seminar involving engineering from Columbia Falls, Sebree and Tucson. R & D will try to organize this before year end.

E. Cambridge also suggested a joint seminar on experimental design would be useful.